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GB 0276015

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(54) Hopper type coin delivery apparatus

(57) A rotor 130 adapted to take in coins "a" accommodated in a hopper 1 for transportation so as to bring the coin into contact with a coin induction piece 4 projecting onto a coin transport surface for feeding the coin into the coin delivery port 5, is constituted by an aperture disc 20 having coin take-in holes 21 and a coin transport surface disc 17 which are combined into one unit, with a coin advancing arcuate vane portion 18 being disposed therebetween as a spacer so as to extend up to an outer diameter of the rotor 130, whereby the clearance between the aperture disc 20 and the coin transport surface 17a is positively maintained by the entire structure to prevent coins from being bitten or wedged in between the aperture disc 20 and the coin transport surface 17a or between the aperture disc 20 and the coin induction piece 4 by prising up the aperture disc 20.

FIG. 3

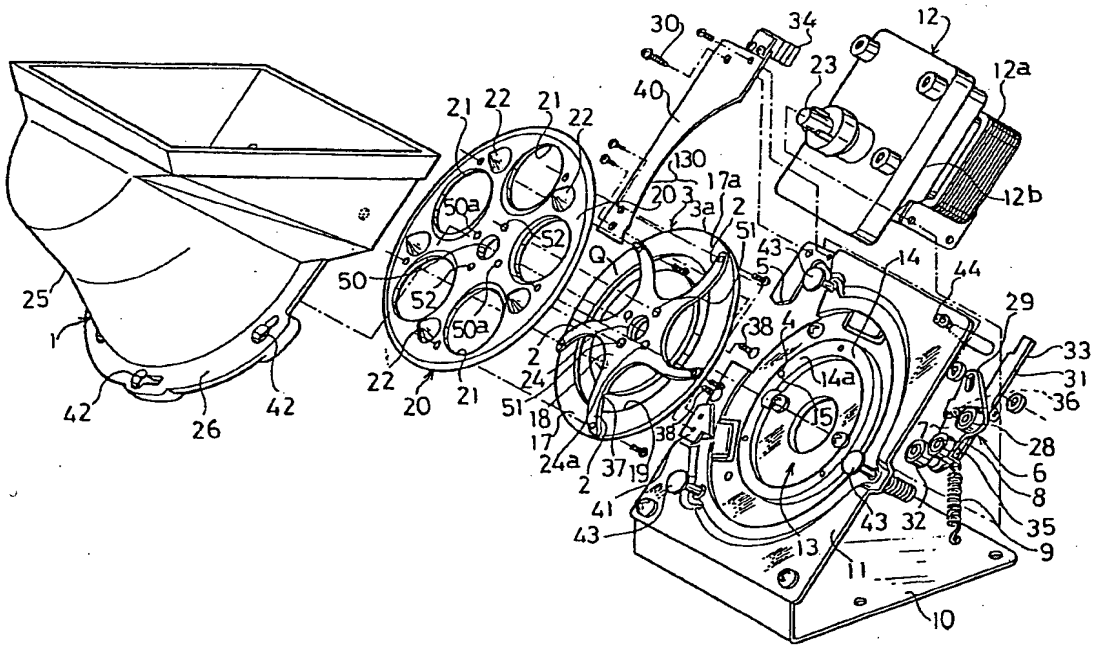

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FIG.1
PRIOR ART

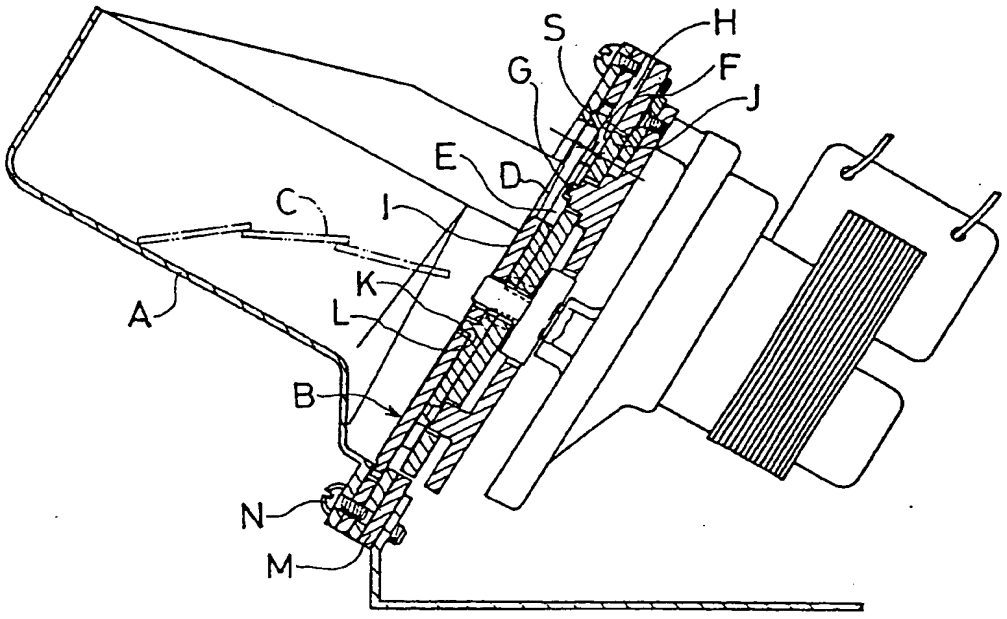


FIG.2

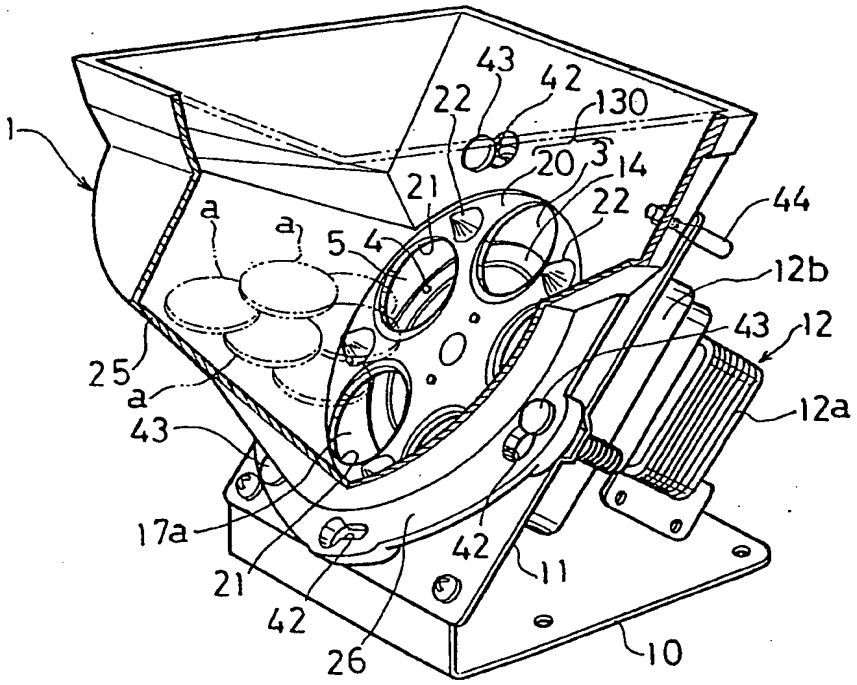
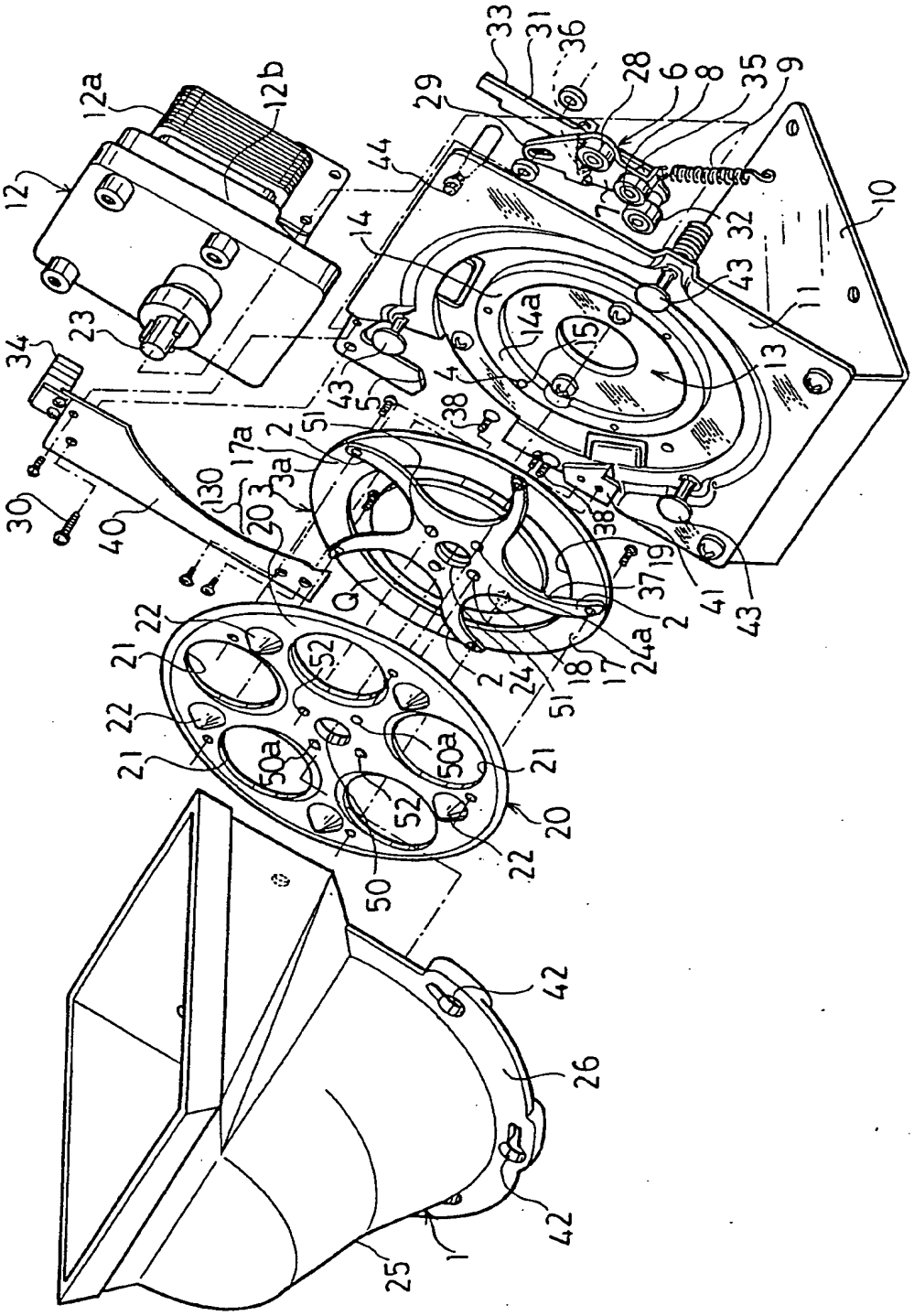


FIG.3


12a
12b
12
33
31
36
28
6
8
35
9
29
44
14
10
32
43
11
14a
15
13
1
23
34
4
5
38
51
2
17a
3a
130
20
3
30
40
38
19
37
41
43
22
21
52
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18
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24a
50a
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42
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25

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FIG.4

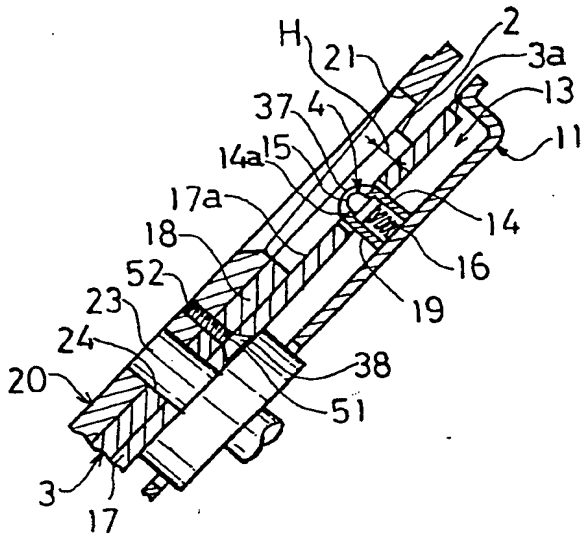


FIG.5

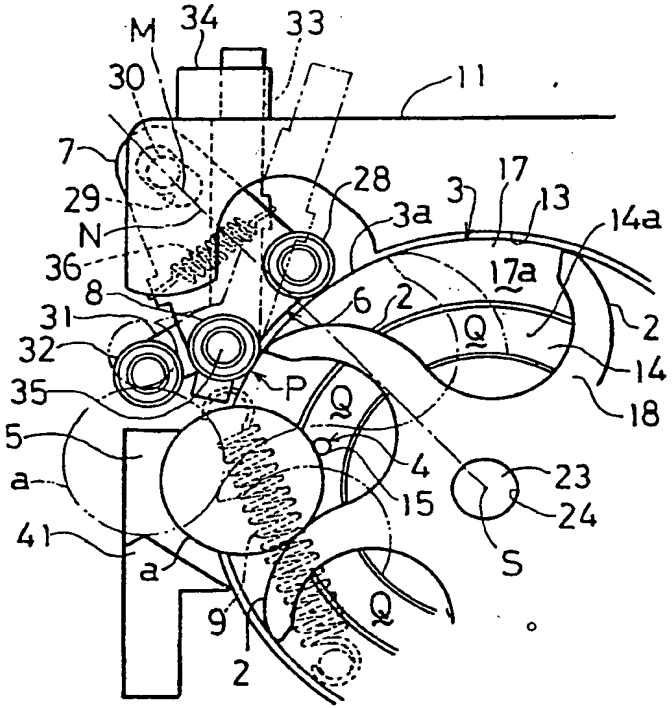
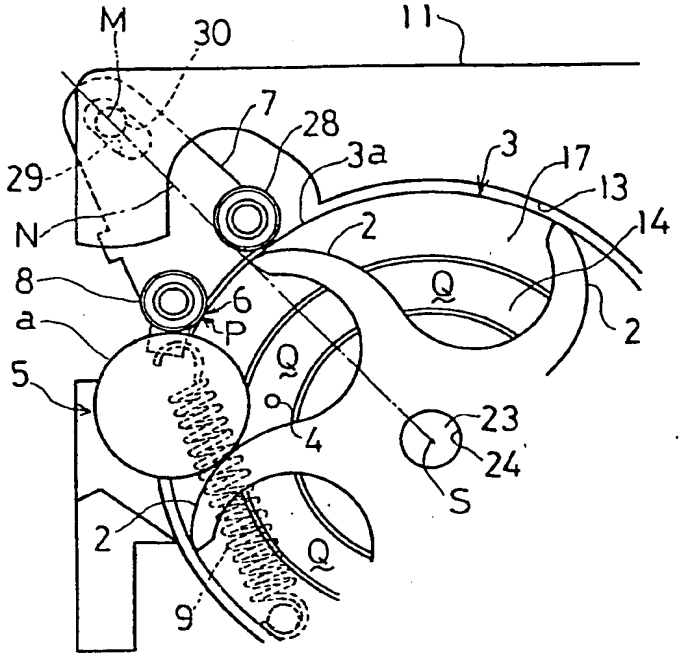


FIG. 6


M
30
11
7
28
3a
3
17
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14
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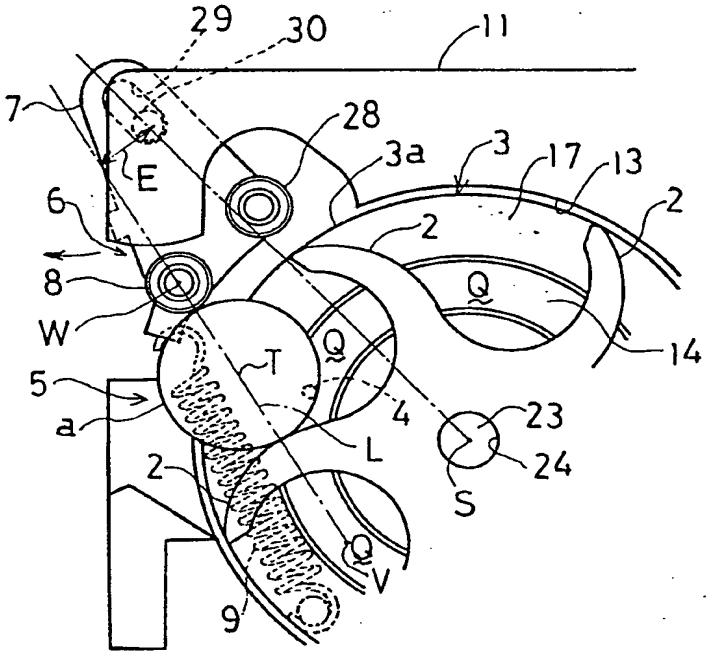
N
2
8
6
P
Q
a
5
4
23
24
S
2
Q
9

FIG. 7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3a
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17
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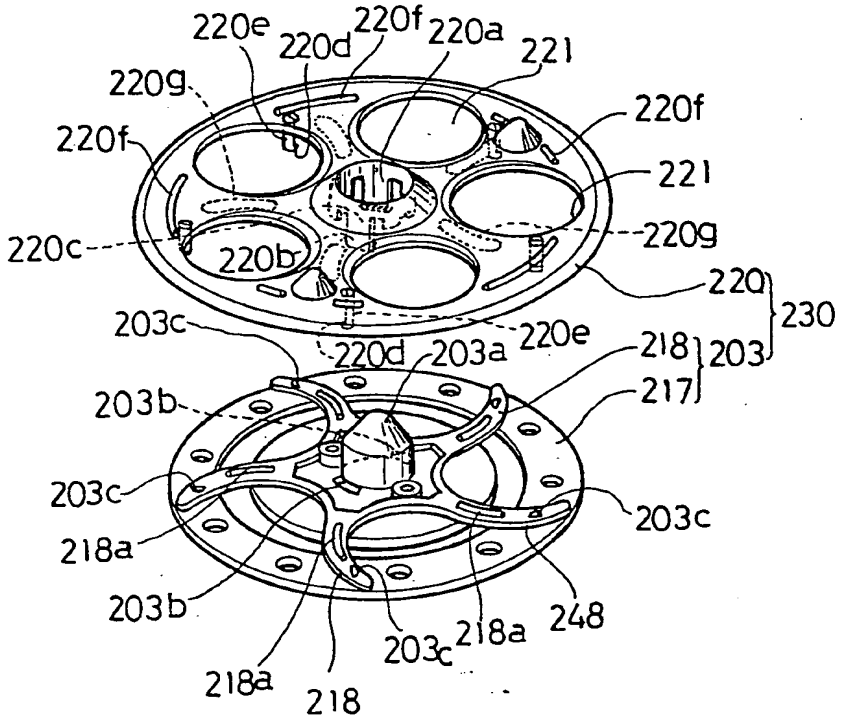
FIG. 8



SPECIFICATION

Hopper type coin delivery apparatus

The present invention generally relates to a hopper type coin delivery unit provided in a slot machine, money exchanging machine, automatic vending machine or the like for paying out the required number of coins (including items similar to coins such as medals, etc.) or for merely counting coins charged into a hopper while they are fed out, and more particularly, to a hopper type coin delivery apparatus which is so arranged that the coins contained in the hopper are taken in onto a rotor provided with a pluvality of arcuate vanes so as to be pushed forward by said arcuate vanes for being transported towards a coin induction piece projecting at a part on a coin transport surface, so that the coins thus transported are transferred from said rotor to a coin delivery port by the induction piece.

The coin delivery apparatus of the above described type has already been proposed by the present applicant and disclosed in Japanese Patent Laid-Open Publication Tokkaisho No. 59-81784. As shown in Figure 1, this apparatus is so arranged that the rotor B directed towards the bottom portion of the hopper A is adapted, when it is driven, to take the coins C in the hopper A into between arcuate vanes E through coin take-in holes D for transportation. In this case, the induction piece G as described earlier and erected on the coin transport surface F through the annular slit N from the reverse face side of said transport surface is brought into contact with the coin C thus transported, and guides the coin C towards the coin delivery port H.

However, in the rotor B as described above, the arrangement is merely such that the aperture disc I having the holds D is made into one unit in the rotating divestion, with respect to the arcuate vanes E and the side of the member J providing the coin transport surface F by the fitting between the pin K and the hole L. This arrangement undesirably allows some of the coins which are taken in between the arcuate vanes E of the rotor B for being transported, to attempt to become free from the guiding by the induction piece G of a stationary nature, and thus, to be forced or bitten into the gap S with respect to the induction piece G in a state to push away the aperture disc I. Meanwhile, if it is attempted to establish conditions for the rotor B to easily take in the coins C, for example, by increasing the number of revolutions of the rotor B or by reducing the inclination of the rotor B, there may sometimes occur such an inconvenience that more than one coins bite or wedge themselves into the gap between the transport surface K and the disc I, which gap is normally determined in dimensions to take in only one coin C, when these coins tend to be forced into said gap while trying to push away the disc I.

The "bite-in" or cutting-in by the coins as described above invites such disadvantages as forced stopping of the rotor, and deviations in the dimensions or surface configurations accurately adjusted or finished, etc.

Moreover, in the conventional coin delivery apparatus as referred to above, since for example, the hopper A is mounted on the side of the base M by several screws N, it is not easy to disassemble the apparatus even when the bite-in as described above takes place, thus making it difficult to readily cope with the situation.

Accordingly, it is a primary object of the present invention to provide an improved hopper type coin delivery apparatus which is arranged to be free from the bite-in or cutting-in by coins as described above.

It is a secondary object of the present invention to provide a hopper type coin delivery apparatus of the above described type in which, when the improvement for achieving the above primary object is effected in combination with a construction to make it possible to retract the induction piece only from the rotor, the coin which is not to be guided to the delivery port by the retraction of the induction piece can be further guided to said delivery port without any hindrance to the achievement of the primary object.

It is a third object of the present invention to provide a hopper type coin delivery apparatus of the above described type which can be readily disassembled to cope with the situation, even if coins should bite in as described earlier.

The most essential feature of the present invention resides in that arcuate vanes of the rotor are each formed to extend up to the outer diameter of the rotor, and that an aperture disc and a coin transport surface disc are combined into one unit, with the arcuate vanes as described above being held there between as a spacer, thereby to constitute the rotor.

By the above arrangement, the aperture disc is positively maintained in its gap accurately set with respect to the coin transport surface over the entire area thereof, and the disadvantage that more than two coins are forced into or bitten into between the aperture disc and the transport surface by pushing away the aperture disc with such coins, may be fully eliminated. At the same time, escaping by the aperture disc single body with respect to the induction piece of a fixed nature directed towards the transport surface, can also be eliminated. Moreover, since the aperture disc and the rotor on the whole are increased in the rigidity thereof by the one unit formation as described earlier, with the important clearance between the aperture disc and coin transport surface being positively maintained, even when the aperture disc and the whole rotor are formed by a material other than metals, for example, by an abrasion resistant synthetic resin material, they may be used without any problem.

A second feature of the present invention is such that the induction piece directed towards the coin transport surface from the stationary side is provided for free protrusion or retraction through biasing by a spring so as to be normally at a predetermined projecting position, while a separator constituted by supporting a separate roller on a rocking plate is provided in the vicinity of the coin induction piece, and said rocking plate is urged by a spring so as to be attracted towards the rotor side for positioning of said separate roller at a reference

position in the vicinity of the rotor outer periphery, and simultaneously, said rocking plate is provided pivotally and for straight movement, so that the separate roller can be retreated from said reference position to the side opposite to the rotor, with lateral movements following rocking motion of said rocking plate.

By the above arrangement, even when a coin tends to bite in the gap with respect to the aperture disc, since the induction piece escapes, upon depression by the coin, against the spring force, there is no possibility that the undesirable bite-in by coins takes place as in the conventional arrangement.

Meanwhile, the coin bite-in prevention function by the induction piece as described above means that the coins can not be guided to the delivery port, and the coins not guided as above are further guided to the delivery port by the separate roller provided in the vicinity of said induction piece, thus the coin delivery efficiency not being reduced. In the guiding of the coins by the separate roller as referred to above, by the lateral and straight movements of the rocking plate having the returning nature to the rotor side original port, with respect to the coin still tending to bite into between the rotor and separate roller, the coin is caused to escape in response to the movement thereof, while it is led to the delivery port until just before arrival of the coin at a point of complete escaping from the separate roller, and thus, only the coins not fully guided then are allowed to escape. Accordingly, the bite-in by the coin between the separate roller and the rotor may also be prevented, without any reduction in the coin delivery efficiency.

A third feature of the present invention resides in that the rotor can be mounted onto a driving shaft projecting from the fixed base plate for simultaneous rotation therewith only through releasable fitting thereof onto said driving shaft in the axial direction, while in addition, the hopper is detachably mounted on the side of the fixed base plate in a direction parallel to said base plate in such a manner as to rotatably hold the outer peripheral portion of the rotor in a gap with respect to the fixed base plate.

By the above construction, the hopper may be readily and quickly attached or detached only through the engagement or disengagement of the engaging portion with respect to the fixed base plate side, and upon detachment of the hopper, the rotor can be readily and quickly detached or attached only by the withdrawal or depression in the axial direction with respect to the driving shaft. Owing to the above arrangement, even if a coin should bite in, the trouble can be readily and quickly rectified by removing the hopper and rotor. Furthermore, assembling after the disassembly may also be effected simply and quickly.

These and other objects and features of the present invention will become apparent from the following description with reference to the attached drawings.

Figure 1 is a longitudinal side sectional view showing one example of a conventional coin delivery apparatus;

Figure 2 is a perspective view partly broken away, of an entire coin delivery apparatus according to one preferred embodiment of the present invention;

Figure 3 is an exploded perspective view of the coin delivery apparatus of Figure 2;

Figure 4 is a fragmentary sectional view showing the positional relation between the rotor and the induction piece;

Figures 5 through *7* are fragmentary side sectional view showing the relation among the rotor, separator and coin in various operating states; and

Figure 8 is an exploded perspective view showing a rotor of a synthetic resin as disassembled according to another embodiment of the present invention.

Referring now to the drawings, there is shown in Figures 2 through 7 an improved coin delivery apparatus according to one preferred embodiment of the present invention.

As shown in Figures 2 and 3, the coin delivery apparatus of the present invention generally includes an apparatus base 10, an inclined base plate 11, a driving mechanism 12 having a motor 12a and reduction gears 12b, a rotor 130, an aperture disc 20 and a hopper 1 which are to be combined into the unit in the manner to be described in more detail hereinafter.

As is most clearly seen in Figure 3, the inclined base plate 11 arranged to be inclined with respect to a vertical plane is provided with a circular recess 13 for rotatably supporting the rotor 130, and a coin delivery port 5 formed at one side portion thereof. In the circular vecess 13, there is concentrically disposed a guide ring 14, at a predetermined position of which ring 14, a coin induction piece 4 is provided so as to be selectively protruded from or retracted into a guide surface 14a of said guide ring 14. More specifically, as shown in Figure 4, the above coin induction piece 4 is constituted by a projection/retraction piece i.e. movable piece 15, and a spring 16 for urging said movable piece 15 upwardly, and the movable piece 15 is normally projecting onto the guide surface 14a so as to function to lead the coin "a" transported by the rotor 130 towards the coin delivery ports.

The coin delivery port 5 referred to above is formed by cutting out part of the side portion of said inclined base plate 11, and is normally covered by a cover plate 40, while, on the lower edge of said coin delivery port 5, a guide piece 41 is fixed to guide the coin "a".

On the other hand, in the circular recess 13, the rotor 130 is rotatably fitted. As shown in Figure 3, this rotor 130 includes a rotor base plate 3 having a disc portion 17 and a vane portion 18 integrally formed, and in the disc portion 17, there is formed a ring hole 19 which is movably fitted around the guide ring 14 described earlier. By the movable fitting of the disc portion 17 onto the circular recess 13 and the guide ring 14, said rotor 130 is rotatably journalled by the inclined base plate 11. The upper surface of said disc portion 17 is formed into a coin transport surface 17a for transporting the coin "a" thereover. Meanwhile, the vane portion 18 is formed with five arcuate vanes 2 each having a length extending up to an outer diameter of the rotor 130, with coin holding spaces Q

being formed between the respective arcuate vanes 2. Moreover, in the reverse surface of each of the arcuate vanes 2, there is formed an annular slit 37 for avoiding interference with respect to the movable piece 15 of the induction piece 4.

On the upper surface of the rotor base plate 3, the aperture disc 20 is fixed by set screws 38, and it is so arranged that the whole region between the aperture disc 20 and the coin transport surface 17a of the disc portion 17 is positively maintained at a predetermined interval H, with the arcuate vanes 2 being provided there between as a spacer. For this purpose, screw inserting holes 51 are provided in the rotor base plate 3, while threaded holes 52 are formed in the aperture disc 20, respectively at central and outer peripheral portions.

For the formation of the interval H, it is necessary to form at high accuracy, the flatness at the joint surfaces of the respective aperture disc 20 and to rotor base plate 3, and the squareness thereof with respect to a driving shaft 23 to be described later. It is to be noted here that the interval H should preferably be determined at 2 mm when the thickness of coin "a" is 1.5 mm, while the allowance thereof should desirably be set at ±0.05 mm for a favorably result.

The aperture disc 20 has five coin take-in holes 21 which are communicated with the coin holding spaces Q described earlier, and each of the coin take-in holes 21 functions to take in the coins "a" accommodated within the hopper 1 into the coin holding spaces Q of the rotor base plate 3. On the disc 20 in positions between the respective coin take-in holes 21, there are provided agitator projections 22 for stirring the coins.

The rotor base plate 3 described above is arranged to be rotated clockwise in Figure 3 in one unit with the aperture disc 20. The rotor base plate 3 and the aperture disc 20 are to be driven for rotation by the driving mechanism 12 referred to earlier, and for the connection between the both, there are provided in the rotor base plate 3 and the aperture disc 20, engaging holes 24, 24a, 50 and 50a for engagement with the driving shaft 23 of the driving mechanism 12.

Meanwhile, the hopper 1 includes a coin accommodating portion 25 and a flange portion 26. The flange portion 26 is formed with a plurality of engaging holes 42, while the inclined base plate 11 is provided with corresponding engaging pins 43 and a positioning pin 44, and through utilization of these holes and pins, the hopper 1 is detactably mounted on the inclined base plate 11.

In the vicinity of the coin induction piece 4 referred to previously, there is disposed, as shown in Figures 5 and 6, a separator 6 constituted by supporting a separate roller 8 and auxiliary roller 28 on a rocking plate 7. This rocking plate 7 has an elongated support hole 29 which is fitted over a pivotal shaft 30 fixedly provided on the base plate 11. Meanwhile, the rocking plate 7 is urged by a tension spring 9 to be attracted towards the side of the rotor 130, as a result of which, the separate roller 8 and the auxiliary roller 28 are held in contact with the outer peripheral edge 3a of the rotor base plate 3. The position thus determined, i.e. the position shown in Figures 4 and 5, renders to support the separator 6, and consequently, the separate roller 8 by the pivotal shaft 35. Although the counter lever 31 is held at the position indicated in solid lines in Figure 5 by a return spring 36, it is pivoted as shown by imaginary lines each time the coin "a" passes through the coin delivery port 5, and as a result of the detection of the passage of the coin "a" by a sensor 34, the number of passing coins "a" can be counted. Furthermore, at the bottom portion of the circular recess 13, blain bearings 100 are provided at three equally divided positions in the circumferential direction for receiving the rotor 130. Since the rotor 130 is made of a metallic material, the bearing 100 are made of a synthetic resin material in this embodiment.

Subsequently, functions of the coin delivery apparatus of the present invention having the constructions as described so far will be explained hereinafter.

Upon rotation of the rotor 130 in the clockwise direction in the figure by the driving mechanism 12, the coins "a" within the hopper 1 are taken into the coin holding spaces Q of the rotor base plate 3 from the coin take-in holes 21 of the aperture disc 20.

The coins "a" in the coin holding spaces Q are pushed forward by the arcuate vanes 2 so as to be transported towards the coin induction piece 4.

Thus, as shown in Figure 5, upon contact of the coin "a" with the coin induction piece 4, said coin is turned in its direction thereby, and led towards the coin delivery port 5. As described previously, when the coin "a" passes through the coin delivery port 5, it causes the counter lever 31 to pivot and thus, the number of passing coins is counted.

The induction piece 4 is formed in a movable construction, and in the present embodiment, since the movable piece 15 urged upwardly by the spring 16 is arranged to be vertically movable, any coin assuming an abnormal posture (probability therefor it small) among the coins "a" transported by the rotor 103, causes the movable piece 15 to sink into the guide surface 14a of the guide ring 14, and tends to pass over the coin induction piece 4 as it is. Meanwhile, when no coin is present in the coin holding spaces Q, there may be a case where a coin "a" which comes jumping in from the coin take-in hole 21 assumes a similar state. In the conventional arrangement, there has been such a problem that such a coin "a" is pressed against (or bitten by) the coin induction piece in the fixed state, but according to the present invention, since the coin induction piece 4 is adapted to be movable, such a problem can be advantageously solved.

Figure 5 shows the state where the coin "a" which has not been led towards the coin delivery port 5 by the coin induction piece 4 comes into contact with the separate roller 8 of the separator 6. Most of the coins brought into such a state, are led to the coin delivery port 5 by the action of the separate roller 8 as shown in Figure 6. In the present embodiment, since the separate roller 8 is in contact with the outer peripheral edge 3a of the rotor base plate 3 so as to follow in rotation at high speeds, the coin "a" may be led to the coin delivery port 5 more smoothly.

In Figure 7, there is illustrated a case wherein the

center T of a coin "a" comes onto a line L which connects the center V of the radius of curvature of the arcuate vane 2 with the center W of the separate roller 8 so as to bring into question, the pressing against each other (or bite-in) among the three, although the propability of occurrence of such a case is very small. In the present invention, as shown in Figure 7, the rocking plate 7 advances straight towards the side opposite to the rotor 130 against the spring 9 urging said rocking plate 7, and the separate roller 8 retreats towards the side opposite to the rotor 130, while following the rocking motion of the rocking plate in the direction of the arrow, the separate roller 8 is piroted in the direction of the arrow, and therefore, the bite-in as described earlier may be prevented, with the coin "a" being led towards the coin delivery port 5. Furthermore, in the present embodiment, since the pivotal axis 30 is located in the position eccentrically positioned by E with respect to the line L, the rocking plate 7 is arranged to automatically pivot in the direction of the arrow upon receipt of the depressing pressure by the coin "a", and thus, most of the coins "a" brought into the state as shown in Figure 7 can be led towards the coin delivery port 5.

There may be rare cases where the coin "a" is directed rightwards from the state as shown in Figure 7, or the coin "a" jumped in from the coin take-in hole 21 advances towards the right of the separate roller 8, but in such a case, the coin "a" is again led into the coin holding spaces Q of the rotor 103 by the function of the auxiliary roller 28 (escaping action), so that no problem for the undesirable bite-in is invited.

It should be noted here that the present invention is not limited in its application to the foregoing embodiment alone, but may be constructed in various ways. For example the coin induction piece 4 may be constructed by a rotatable member for a movable structure. Meanwhile, the separator 6 is not limited in the foregoing embodiment, but may be modified into the construction, for example, without the auxiliary roller 28. Furthermore, the spring 9 for urging the rocking plate 7 may be constituted by a torsion spring.

Referring further to Figure 8, there is shown one example of a rotor made of a synthetic resin according to another embodiment of the present invention. In this embodiment, the rotor base plate 203 including the disc portion 217 and the arcuate vane portion 218 is integrally molded by an abrasion resistant resin. Similarly, the aperture disc 220 having the coin take-in holes 221 is also made of the same abrasion resistant synthetic resin as that for the rotor base plate 203.

In the rotor base plate 203, at the fixing base portion of the arcuate vane portion 218 with respect to a boss portion 203a which serves as a mounting portion onto the driving shaft, engaging holes 203b with respect to the aperture disc 220 are formed at two portions on a diametrical line. Furthermore, at the forward end portions of the respective arcuate vanes 218, engaging holes 203c with respect to the aperture disc 220 are similarly formed.

On the other hand, in the aperture disc 220, on the peripheral wall of a central bore 220a which is fitted onto the boss portion 203a of the rotor base plate 203 for the alignment, engaging projections 220c having retaining claws 220b for elastic engagement with the engaging holes 203b at the fixing base portion of said arcuate vane portion 218, are formed, while at the outer peripheral portion, there are similarly formed engaging projections 220c having retaining claws 220d for elastic engagement with the respective engaging holes 203c of the arcuate vane portion 218.

These rotor base plate 203 and aperture disc 220 as described above are formed into one unit as the rotor 230 by resiliently engaging the engaging holes 203b and the engaging projections 220c, and the engaging holes 203c and the engaging projections 220e, during fitting of the boss portion 203a with the central bore 220a. The one unit structure formed in the manner as described above is adapted to provide, by the engagement of the retaining claws 220b and 220d with the engaging holes 203b and 203c, a sufficient strength for preventing such inconveniences that more than two coins bite in between the aperture disc 220 and the coin transport surface 217a while prying up the aperture disc 220. However, since the engagement as described above can be released elastically, for example, by prying open, etc., with a tool inserted between the aperture disc 220 and the disc plate 217a, the rotor may be disassembled if required.

Furthermore, agitator projections 222 are provided only at two positions deviated towards one side from the diametrical line of the aperture disc 220, and it is so arranged that, by the deviation, the coin stirring action is provided with a random nature so as to improve the stirring effect. Meanwhile, on the outer peripheral portion of the upper surface of the aperture disc 220, protuberances 220f which are loosely fitted with the bottom opening of the hopper are formed, thereby to prevent the coins from biting in between the opening portion of the hopper and the aperture disc 220. The above arrangement is particularly effective in the setting of conditions in which coins may be readily bitten in, i.e. in such cases as operation at high speeds, handling of a large number of coins, horizontal installation of the rotor for the improvement on the coin delivery efficiency.

On the upper surface of the arcuate vane portion 218, reinforcing ribs 218a are formed on the respective vanes along the lengthwise direction to achieve a strength increase in the arcuate vane portion 218 itself, while by the fitting of the reinforcing ribs 218a into the grooves 220g formed in the reverse surface of the aperture disc 220, the vane portion is held in the coin transport direction, thereby to provide further reinforcement in that direction.

CLAIMS

1. A hopper type coin delivery apparatus comprising a rotor provided with a plurality of arcuate vanes for taking-in thereonto coins accommodated in a hopper so as to push forward

said coins by said arcuate vanes, a coin transport surface disc, and a coin induction piece projecting onto the coin transport surface of said coin transport surface disc, said coins being transported towards said coin induction piece so as to be transported thereby from said rotor into a coin delivery port, characterized in that said rotor includes the arcuate vanes extending up to an outer diameter thereof, and an aperture disc having coin take-in holes, and the coin transport surface disc, which are combined into one unit, with said arcuate vanes being disposed between said aperture disc and said coin transport surface disc as a spacer.

2. A hopper type coin delivery apparatus according to Claim 1, characterized in that said coin induction piece is provided to be urged by a spring for free projection or retraction so as to be normally at a predetermined projecting position onto the coin transport surface, with respect to the base plate side fixed portion facing the coin transport surface from annular slit of the coin transport surface disc, said coin delivery apparatus further comprising a separator including a separator roller supported by a rocking plate and disposed in the vicinity of said coin induction piece, said rocking plate being urged by a spring so as to be attracted towards the rotor side for positioning of said separate roller at a reference position near the outer periphery of said roller, with said rocking plate being provided pivotally and also for straight movement, whereby said separate roller being able to retreat towards to side oppsite to the rotor from said reference position, and also to laterally move following the pivotal movement of said rocking plate.

3. A hopper type coin delivery apparatus according to Claim 1, characterized in that said rotor is arranged to be mounted onto a driving shaft projecting on the fixed base plate only through detachable fitting thereonto in the axial direction for simultaneous rotation as one unit with said driving shaft, said hopper being mounted onto the fixed base plate side through detachable engagement in a direction parallel with said base plate in such a manner as to rotatably hold the outer peripheral portion of said rotor between said hopper and said fixed base plate.

4. A hopper type coin delivery apparatus as claimed in Claim 1, wherein said aperture disc and said coin transport surface disc are formed into one integrally molded structure.

5. A hopper type coin delivery apparatus as claimed in Claim 1, wherein said rotor is made of a synthetic resin material.

6. A hopper type coin delivery apparatus as claimed in Claim 5, wherein said aperture disc and said coin transport surface disc are combined into one unit by elastic engagement between engaging holes formed in one side of said aperture disc and said coin transport surface disc, and corresponding engaging projections having retaining portions and formed in the other side thereof.

7. A hopper type coin delivery apparatus as claimed in Claim 5, wherein said elastic engagement is effected at positions corresponding to a fixing base portion and forward end portions of said arcuate vanes.

8. A hopper type coin delivery apparatus as claimed in Claim 5, wherein said arcuate vanes and said coin transport surface disc are formed by one piece molding.

9. A hopper type coin delivery apparatus as claimed in Claim 1, wherein said coin induction piece is provided to be urged by a spring for free projection of retraction so as to be normally at a predetermined projecting position onto the coin transport surface, with respect to the base plate side fixed portion facing the coin transport surface from annular slit of the coin transport surface disc.

10. A hopper type coin delivery apparatus as claimed in Claim 9, further comprising a separator including a separate roller supported by a rocking plate and disposed in the vicinity of said coin induction piece, said rocking plate being urged by a spring so as to be attracted towards the rotor side for positioning of said separate roller at a reference position near the outer periphery of said roller, with said rocking plate being provided pivotally and also for straight movement, whereby said separate roller being able to retreat towards the side opposite to the rotor from said referenced position, and also to laterally move following the pivotal movement of said rocking plate.

11. A hopper type coin delivery apparatus as claimed in Claim 10, wherein a counter roller for counting the coins fed out into said coin delivery port is supported by a counter lever journalled on said rocking plate.

12. A hopper type coin delivery apparatus as claimed in Claim 1, wherein said rotor is arranged to be mounted onto a driving shaft projecting on the fixed base plate only through detachable fitting thereonto in the axial direction for simultaneous rotation as one unit with said driving shaft, said hopper being mounted onto the fixed base plate side through detachable engagement in a direction parallel with said base plate in such a manner as to rotatably hold the outer peripheral portion of said rotor between said hopper and said fixed base plate.

13. A hopper type coin delivery apparatus substantially as described with reference to, and as shown in, Figures 2 to 7 or Figure 8 of the accompanying drawings.

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